Firmware Version 3.90a7 Information

LP9402DC/LP9002DC/LP9002C/LP9002L/LP9000/LP952L

Table of Contents

- Compatibility
- Prerequisites
- Cautions and Warnings
- Things to Know Before You Download
- Changes and Corrections
- Known Issues
- Files Included in This Release
  - LP9402DC/LP9002DC/LP9002C/LP9002L/LP9000
  - LP952L

EMULEX copyright © Emulex Corporation - all rights reserved -2003

Firmware Information

Summary

Emulex firmware version 3.90a7 was developed with a focus on performance enhancements for the LP9402DC/LP9002DC/LP9002C/LP9002L/LP9000/LP952L series. Several CRs addressing problems with self−test have been corrected (CRs 3788, 3803, 3707, 3708, 3397, 3534, and 3495), as well as CRs involving time−outs (CRs 3856, 3853, 3854, 3860, 3861, 4221, 4213, 4205, and 4224). See the Changes and Corrections section for a complete listing. This download page also lists four CRs specific to lp6dutil (DOS utility).

Compatibility

- Firmware version 3.90a7 for LP9402DC/LP9002DC/LP9002C/LP9002L/LP9000 is compatible with the LP9402DC, LP9002DC, LP9002C, LP9002L and LP9000 HBAs.
- Firmware version 3.90a7 for LP952L is compatible with the LP952L HBA.

Prerequisites

- Local boot disk
- The intended Fibre Channel target should be big enough to hold all system files and the swap slice of the current local boot disk

EMULEX copyright © Emulex Corporation - all rights reserved -2003

Cautions and Warnings

Caution If you use the DOS utility, lp6dutil, to update the firmware, you must use Version 8.6a4 or higher. Versions older than Version 8.6a4 are not supported by Emulex to update the firmware. The latest version of lp6dutil (Version 8.7a8) is included with this firmware kit.

Things to Know Before You Download

- Make a directory on your system before you download and unzip the firmware update files.
- Ensure that critical files on your local boot disk are backed up as a measure of protection.
- Firmware version 3.90a7 for LP9402DC/LP9002DC/LP9002C/LP9002L/LP9000 uses a Universal Boot image. Firmware version 3.90a7 for LP952 uses a BootBIOS image.
- This release contains .dwc and .awc files.

- The lp6dutil is a DOS−based utility that enables you to test the host adapter board and to update firmware and boot code. If you use the DOS utility, lp6dutil, to update the firmware, we recommend that you use version 8.7a8. This is the latest version of lp6dutil and is included in this kit.
- If you are currently using an Emulex driver, you can update firmware and boot code with the diagnostic utility that was loaded when the driver was installed.

EMULEX copyright © Emulex Corporation - all rights reserved -2003

Changes and Corrections

Note	Changes may require the driver, the operating system, or other levels of software to be compatible, and as a result some of these features may not be available on all configurations.

- Inactive exchange control blocks now have their X_ID obscured to insure that they will not affect active exchanges. (CRs 3916, 3917, 3653, 3656)
- Corrected a problem with the adapter firmware resetting the sequence flags on an S_ID mismatch in an invalid manner. This was found only in target mode, under very heavy loads and in extreme circumstances. (CRs 3792, 3791)
- Improved operation of E_D_TOV timer when closing exchange. (CRs 3794, 3793)
- Corrected a self−test problem reporting the wrong internal test number. (CRs 3788, 3803)
- Improved wake−up failure reporting capability. Added the ability to read the additional wake−up errors from SLIM memory. (CRs 3804, 3807)
- Due to the length of time required to close out an aborted exchange with a remote port which is not responding, the "early abort notification" is now forced into the active state for commands that have timed out. (CRs 3853, 3854)
- Solved a time−out problem when switching from LOOP to P2P when connected to a switch port. (CRs 3806, 3856)
- Added extra delay time to TX/RX DMA time−out trap to allow for special PCI bus designs (CRs 3860, 3861)
- Corrected a problem with the data transfer flag. Once data transfer was complete after a link went down, the transfer was incorrectly flagged as an internal BIU error. (CRs 3616, 3478)
- Corrected response to READ_LA mailbox command so that valid current and link down state information is returned. (CRs 3630, 3635)
- A method of detecting and correcting a single−bit FLASH error was added for the 128K FLASH boot sector. This method addresses all known instances of charge migration in the FLASH. (CRs 3709, 3710)
- An alternate method of handling PCI Lock during self−test was put into place to significantly lower the chances of a self−test failure hanging the PCI bus. (CRs 3707, 3708)
- Allocated four extra buffers for FICON performance enhancement. (CRs 3629, 3632)
- Corrected a problem with reviving expired exchange during ABTS processing. (CRs 3631, 3636)
- Changed SLI Target to operate as a PLDA type device in order to achieve better resiliency in target mode. (CRs 3493, 3494)

EMULEX copyright © Emulex Corporation - all rights reserved -2003

- Improved FICON exchange handling to avoid filling the response ring in a custom driver during heavy I/O. (CRs 3393, 2725)
- During research on a different problem, an analyzer trace showed that the adapter was replying to TEST and ESTC frames. This was corrected to issue no reply and to ignore the frames. (CRs 3394, 2898)
- Corrected the following problem: adapter firmware ignored ABTX els COMMAND and did not respond to the host. Corrected by issuing LS_RJT (link server reject) in response. (CRs 3521, 3533)
- Corrected the following problem: if a boot failed due to a fast BIOS ROM read request time−out of a particular model of host computer. Corrected the problem by speeding up the self−test in the firmware. (CRs 3397, 3354, 3495)
- Added buffer allocation, sizing, and handling for new buffer memory chip addressing feature of the v1.2 Centaur chip. (CRs 3535, 3131)
- Improvements were made in the processing of commands in order to increase the number of I/Os per second. (CRs 3536)
- A problem with buffer compare errors after running a certain test program for a period of days with a LIP every 15 seconds was resolved. (CRs 3460, 3579)
- A feature enhancement was added to the SLI by customer request. (CRs 3345, 3110)
- Corrected a problem that caused a stall. A particular request from the driver would cause a stall when connected to the fabric, but not when connection to an N−port. (CRs 3344, 3465)
- A loopback−frame workaround for problems with a particular drive was re−implemented. (CR 3576)
- Speed negotiation was refined in step with refinements to Fibre Channel specification FC−FS version 1.2. (CR 3580)
- Improper response to an REC command when not in FCP−2 recover was changed to Command Not Supported. (CR 3582)
- Corrected a firmware−to−driver response problem when closing an FCP−2 tape exchange. (CRs 3583, 3586)
- Changed SLI−2 feature indicator level from 2 to 3 to reflect the recently added features. (CRs 3604, 3605)
- The firmware now cleans up any outstanding parity error bits in the ASIC immediately after startup. (CRs 4046, 4075)
- The current version of Emulex ASIC does not interrupt the firmware on the HBA if there is a PERR during a PCI Memory Write. This firmware change will poll the status bit in the ASIC instead. (CRs 4030, 4062)
- Corrected problem with LIP causing an internal B−bus parity error. (CRs 4130, 4170)
- Modified the FCP−2 recovery protocol to match FCP−2 Rev 7. Previous modification caused problems with non−compliant targets. These modifications were removed. (CRs 3581, 3584, 3585, 4165, 4169)

EMULEX copyright © Emulex Corporation - all rights reserved -2003

- Corrected problem with adapter sending wrong type code: using TAR to transfer data to a tape drive caused a time−out upon close. The adapter was sending type code REC ELS. This problem has been corrected. (CRs 4221, 4213)
- Corrected problem with firmware which relates to Linux. Storing high file counts (>2000) to tape resulted in an IOCB error 41 upon close and rewind. (CRs 4218, 4222)
- Due to speed negotiation and other initialization when connecting to a switch port for the first time, the HBA internally times out and goes into bypass mode, shutting down the port. The LIP time−out when entering point−to−point negotiation was removed.(CRs 4205, 4224)
- There was a problem with GEN_REQUEST response data buffering under certain conditions, which resulted in a time−out. (CR 4318, 4296)
- The READ_LNK_STAT command now returns the correct Receive Counter value, which properly reflects the buffer credits. (CR 4353, 4346)
- A race condition in firmware resulted when an exchange was aborted only if there were no outstanding exchanges left. (CR 4354, 4351)

lp6dutil−specific Changes and Corrections

- Added command line options to lp6dutil at customer's request. (CR 3577)
- Corrected lp6dutil summary status display to indicate if any errors were encountered in "IGNORE_ERROR" mode. (CR 3578)
- lp6dutil cosmetic change in vendor ID field. (CR 3602)
- Corrected problem with lp6dutil system hang issue when External Loopback test fails and you choose to continue testing. (CRs 3603)

EMULEX copyright © Emulex Corporation - all rights reserved -2003

Known Issues

The following issues have been reported at the time of publication. These issues may not yet have been verified or confirmed and may apply to another product, such as the driver or hardware.

- **Link issue:** When using a gigabit switch and the Windows driver is forced into loop mode, link does not come up. (CR 4262) **Workaround:** Should you experience this problem, do not force loop mode on an HBA connected to a 2−gigabit switch. There are three ways to implement this workaround:

    - Modify the Global Registry. Set the InitLinkFlags Bit 23 to attempt an alternate topology if loop fails.
    - If you have a port driver, you can use the elxcfg configuration utility. From the Tools menu, select Link Control. On the Link Control Parameters window, check the Automatic Topology Detection check box. From the Configuration Menu, select Set. On the Select Configuration window, select Fabric Point−to−Point or Fabric Point−to−Point Automap, as applicable.
    - If you have a miniport driver, you can use the lputilnt utility. Select the Driver Parameter category, then double−click on Topology. A window displays to change the current value. 2 is the default (point−to−point). If 0 is the current value, change the value to 2 or 3 (loop first, then point−to−point).

- **Link issue:** When using a 1−gigabit switch and a 2−gigabit Emulex HBA with the Linux driver set to point−to−point and to auto−detect the link−speed, most of the time the link will not come up. (CR 4265) **Workaround:** Should you experience this problem, force 1−gigabit mode on the HBA by setting the link−speed parameter to (1) (indicating 1 gigabit) in the lpfc.conf file (the configuration file for the main driver). Once you set this parameter, you need to rebuild the driver.

EMULEX copyright © Emulex Corporation - all rights reserved -2003

Files Included in This Release (LP9402DC/LP9002DC/LP9002C/LP9002L/LP9000)

This kit includes the following files:

File Name	Description
readme.txt	Release notes for firmware version 3.90a7
c311rel.txt	Combination BootBIOS and OpenBoot release notes
b160rel.txt	BootBIOS release notes
o131rel.txt	OpenBoot release notes
CDC390a7.dwc	Firmware files for the HBA, with BootBIOS − these files update all components, but do not touch the POST code or kernel.
CDC390a7.awc	Firmware files with loader and BootBIOS − these files update the POST code, kernel and all components.
CD390a7.*	Firmware files without BootBIOS.
/prg_kit/*.*	Individual SLI, BIOS, POST and Config files − also known as the components
lp6dutil.txt	lp6dutil text−based software manual
lp6dutil.exe	DOS−based diagnostic utility version 8.7a8
dev_id.txt	Information on setting unique PCI ID values
ctplus1.cfl	Configuration file to allow PCI ID = F901
fdefault.cfl	Configuration file to allow PCI ID = 1AE5
cdefault.cfl	Configuration file for restoring PCI ID to default

EMULEX copyright © Emulex Corporation - all rights reserved -2003

Files Included in This Release (LP952)

This kit includes the following files:

File Name	Description
readme.txt	Release notes for firmware version 3.90a7
b160rel.txt	BootBIOS release notes
RFB390a7.dwc	Firmware files for the HBA, with BootBIOS − these files update all components, but do not touch the POST code or kernel.
RFB390a7.awc	Firmware files with loader and BootBIOS − these files update the POST code, kernel and all components.
RF390a7.*	Firmware files without BootBIOS.
/prg_kit/*.*	Individual SLI, BIOS, POST and Config files − also known as the components
lp6dutil.txt	lp6dutil text−based software manual
lp6dutil.exe	DOS−based diagnostic utility version 8.7a8

EMULEX copyright © Emulex Corporation - all rights reserved -2003

EMULEX END USER LICENSE AGREEMENT

Any software and documentation provided hereunder (respectively "Software" and "Documentation") are the copyrighted works of Emulex Corporation and/or its suppliers. The use of the Software and/or Documentation is governed by the terms of existing licenses with Emulex Corporation; the license agreement, if any, which accompanies or is included with the Software and/or Documentation; or with the terms of this license (each a "License Agreement"). The Software and/or Documentation are made available solely for use by purchasers and/or licensees of Emulex products. In addition, permission to use Documentation is granted, provided that (1) the below copyright notice and this permission notice appears on all copies, (2) use of such Documentation is for informational and non−commercial or personal use only, (3) the Documentation will not be copied or posted on any network computer or broadcast in any media, and (4) no modification of any Documentation is made. Any use, reproduction, or redistribution of the Software and/or Documentation not in accordance with the License Agreement is expressly prohibited by law, and may result in severe civil and criminal penalties. Violators will be prosecuted to the maximum extent possible.

COPYING OR REPRODUCTION OF THE SOFTWARE TO ANY OTHER SERVER OR LOCATION FOR FURTHER REPRODUCTION OR REDISTRIBUTION IS EXPRESSLY PROHIBITED, UNLESS SPECIFICALLY AUTHORIZED IN WRITING BY EMULEX. THE SOFTWARE IS WARRANTED, IF AT ALL, ONLY ACCORDING TO THE TERMS OF THE LICENSE AGREEMENT. EXCEPT AS SPECIFIED IN THE LICENSE AGREEMENT, EMULEX CORPORATION HEREBY DISCLAIMS ALL WARRANTIES WITH REGARD TO THE SOFTWARE, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE, AND NON−INFRINGEMENT. EMULEX AND/OR ITS RESPECTIVE SUPPLIERS MAKE NO REPRESENTATIONS ABOUT THE SUITABILITY FOR ANY PURPOSE OF THE INFORMATION CONTAINED IN THE DOCUMENTATION. ALL SUCH DOCUMENTATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND. EMULEX AND/OR ITS RESPECTIVE SUPPLIERS HEREBY DISCLAIM ALL WARRANTIES WITH REGARD TO THIS INFORMATION, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE, AND NON−INFRINGEMENT. THE DOCUMENTATION COULD INCLUDE TECHNICAL INACCURACIES OR TYPOGRAPHICAL ERRORS. EMULEX AND/OR ITS RESPECTIVE SUPPLIERS RESERVE THE RIGHT TO MAKE CHANGES TO THE PRODUCT(S) AND/OR PROGRAM(S) DESCRIBED HEREIN AT ANY TIME WITHOUT NOTICE. IN NO EVENT SHALL EMULEX AND/OR ITS RESPECTIVE SUPPLIERS BE LIABLE FOR ANY SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES OR ANY DAMAGES WHATSOEVER RESULTING FROM LOSS OF USE, DATA OR PROFITS, WHETHER IN AN ACTION OF CONTRACT, NEGLIGENCE OR OTHERWISE, ARISING OUT OF OR IN CONNECTION WITH THE USE OR PERFORMANCE OF SOFTWARE, DOCUMENTATION, OR PROVISION OF OR FAILURE TO PROVIDE SERVICES.

RESTRICTED RIGHTS LEGEND. Any Software which licensed hereunder for or on behalf of the United States of America, its agencies and/or instrumentalities ("U.S. Government"), is provided with Restricted Rights. Use, duplication, or disclosure by the U.S. Government is subject to restrictions as set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.227−7013 or subparagraphs (c)(1) and (2) of the Commercial Computer Software − Restricted Rights at 48 CFR 52.227−19, as applicable. Manufacturer is Emulex Corporation, 3535 Harbor Blvd., Costa Mesa, CA 92626.

COPYRIGHT NOTICE. Copyright © 2003 Emulex and/or its suppliers, 3535 Harbor Blvd., Costa Mesa, CA 92626 U.S.A. All rights reserved.

TRADEMARKS. Emulex, and/or Emulex products referenced herein are either trademarks or registered trademarks of Emulex. Other product and company names mentioned herein may be the trademarks of their respective owners. The names of companies, products, people, characters and/or data mentioned herein are fictitious and are in no way intended to represent any real individual, company, product or event, unless otherwise noted. Any rights not expressly granted herein are reserved.

Last Updated: October 1, 2001.

Firmware File Types

A list of files is provided when you download your new firmware or in the firmware package readme.txt file.

.dwc and .awc Files

- **.dwc − preferred** Does not include POST code. If the update process is interrupted (such as by a power outage), the POST code is not affected and the download process can be retried.
- **.awc** − Includes POST code. If the update process is interrupted (such as by a power outage) during the POST code update, you may have to return the HBA to Emulex for repair.

The readme file that accompanies the firmware package indicates situations in which you must update the firmware with the .awc file.

Boot Code

Firmware is bundled with or without boot code. Boot code allows you to designate a Fibre Channel drive as the boot drive. If the adapter's devices will be used to boot the system, it is recommended that you use the firmware package that includes boot code. The update procedure will load both the new firmware and boot code at the same time. After updating, refer to the boot code manuals for procedures on enabling the boot code on your adapter.

EMULEX copyright © Emulex Corporation - all rights reserved -2003